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DIVISION 02 - SITE WORK

SECTION 02020

DREDGING / EXCAVATION

02/99

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SECTION 02020

DREDGING / EXCAVATION
02/99

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for all submittals with a "G" designation. The following shall be submitted in accordance with SECTION 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Dredge and Disposal Plan; G

SD-03 Product Data

Least Tern Island Disposal Records

Beach Disposal Records

Nearshore Disposal Site Surveys

Survey Cross-Sections

Beach Nourishment Profiles

SD-04 Samples

Sediment Samples

SD-06, Test Reports

Daily Report of Operations

SD-07, Certificates

Independent Land Surveying Firm; G

Hydrographic Surveyor; G

1.2 REQUIRED WORK

The Lower Santa Ana River Channel, from Station 7+00 to Station 190+00, shall be dredged / excavated to the design invert elevation. All materials shall be removed and disposed of as indicated. Debris and undesirable material shall become the property of the Contractor and shall be removed from the site.

1.3 PRESERVATION OF EXISTING STRUCTURES AND PROPERTY

The Contractor shall conduct dredging/excavation operations in such a manner that existing structures will not be subjected to settlement or

horizontal movement. Caution shall be exercised to prevent damage to bridge piers, channel walls, and the undermining of jetties and revetments. Excessive or unnecessary dredging/excavation may result in an unstable condition at the toe of the structures. The Contractor shall be responsible for repairing any damage which may result from failure to comply with the requirements of these specifications.

1.4 CHARACTER OF MATERIALS

The geotechnical boring logs shown in the drawings are indicative of the types of materials expected to be removed. The materials to be removed will consist of, but not be limited to: fine to coarse sand, silty sand, and occasional gravels, boulders and rip-rap. **Although coarse materials (gravels, boulders and rip-rap) were not encountered in the geotechnical borings, these coarse materials were widely dispersed within the channel, especially in the area from Station 120+00 to 150+00.**

Lenses and thin layers of silt and clay may also be encountered above the project invert. These fine-grained materials, if thoroughly mixed with the predominantly sandy sediments, can be placed on the receiving beach. The exploration indicated that there are layers of native silt and clay found below the invert elevation. This material, if encountered, is non-compatible and cannot be placed on the beach.

The following types of debris have been observed in the channel: tires, plastic sheeting, tree stumps and branches, lumber, personal computers and monitors, large and small appliances, 50 gallon drums, grocery carts, truck bed liners, lawn chairs, and other miscellaneous debris.

Any questions regarding the nature of expected dredge materials shall be directed to the U.S. Army Corps of Engineers, Los Angeles District, Geotechnical Branch, 911 Wilshire Blvd., Los Angeles, CA 90017.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 DREDGE AND DISPOSAL PLAN

The Contractor shall submit a Dredge and Disposal Plan indicating the methods and equipment he proposes to use to conduct all construction related operations. The plan shall be submitted to the Contracting Officer for approval at least 14 days prior to start of dredging operations and shall also include, as a minimum, the following information:

a. Order of dredging operations and all proposed time lines.
b. Operation/use of the work/storage areas
c. List of the equipment to be used and size of the equipment
d. Proposed berm and dike locations
e. Proposed stockpile locations
f. Stockpile removal plan and time frame
g. Haul routes and layout of river crossings; location of proposed ramps
h. Plan for nourishing the Least Tern Island, including construction and removal of access routes
i. Layout of all buoys, anchors, pipelines, and ancillary equipment.

j. If pipelines are to be utilized, plan for placement and maintenance of pipeline thru the surf zone and protection of public from moving / surging pipeline
k. Methods and equipment for positioning at the dredge and nearshore disposal site
l. Methods for transporting and placing material at the disposal site(s) and equipment that will be working on the beach. Include fencing plans.
m. Name and size of dredge. Layout of the dredge and major auxiliary floating plant. This shall include locations of engines and fuel storage, engine types, horsepower ratings, electrical rooms, transformer rooms, emergency generating equipment, and vertical and horizontal access.
n. Sample spreadsheet to be used for the Beach Disposal Records

3.2 DISPOSAL OF DREDGED / EXCAVATED MATERIAL

3.2.1 General

Dredged material shall be transported and deposited within the disposal limits of the areas indicated on the drawings. Any dredged material that is deposited other than in the area indicated on the drawings, or approved by the Contracting Officer, will not be included in the measurement for payment, and the Contractor may be required to remove such misplaced material and deposit it where directed at his own expense. Debris and other unsuitable materials encountered, including stone, shall become the property of the Contractor and shall be removed from the site.

3.2.2 Stones Encountered

Revetment size **and smaller stone, down to gravel (76 millimeters),** encountered in the channel can be placed by the Contractor at the toe of the revetted slopes. Stone **larger than** rip rap size shall become the property of the Contractor.

3.2.3 Least Tern Island Disposal

The Least Tern Island shall be cleared of all vegetation, **excluding pickleweed,** and accepted by the Government prior to the placement of clean sand dredge material on the Least Tern Island. **Clearing shall be conducted for the entire island, including side-slopes down to the high tide line. This will include clearing downslope of the existing fence. Pickleweed shall be left in place.**

Clean sand dredged material shall be transported and deposited on the surface of the island to form a clean, sandy, level cap with a minimum thickness of 18 inches generally within the disposal limits of the areas indicated.

Contractor shall perform grading operations in a manner to not allow any fill material to migrate into the surrounding waters or to cover the adjacent pickleweed. Contractor shall be responsible for removing any sediment that infills into the surrounding waters. Any dredged material that is deposited other than in the area indicated on the drawings, or approved by the Contracting Officer, will not be included in the measurement for payment, and the Contractor may be required to remove such misplaced material and deposit it where directed at his own expense. Debris and other unsuitable materials encountered, including stone, shall

become the property of the Contractor and shall be removed from the site.

Least Tern Island Disposal Records. The Contractor shall record the number of truck loads of material to the Least Tern Island on a daily basis and provide a cumulative summary of truck loads and quantity (cubic yards).

3.2.4 Beach Disposal

Dredged material shall be transported and deposited within the disposal limits of the areas indicated. Non-beach compatible material shall become the property of the Contractor and is not to be placed on the beach. **The upper size limit of beach compatible material, using the Unified Soils Classification, is coarse gravel (76 millimeters).** The dredged material shall be deposited in a uniform manner progressing from the shoreward side to the seaward side of the fill. The beach fill shall progress as identified on the drawings. The Contractor shall provide the necessary equipment to shape, groom, and dress the beach during fill operations.

The fill materials shall be placed into the existing landside features, slopes, etc., so as to leave a smooth and pleasing appearance. Upon completion of filling operations at each cell, the fill shall be graded and dressed so as to eliminate any undrained pockets and abrupt humps and depressions in the beach fill surfaces and adjacent landside topographic features. The bank caused by wave forces shall be graded down to a slope not steeper than 1 vertical on 15 horizontal.

Any material that is deposited other than in the areas indicated on the drawings, or approved by the Contracting Officer, will not be included in measurement for payment and the Contractor may be required to remove such misplaced material and deposit it where directed at his own expense. Disposal of material above the elevations indicated on the drawings will not be permitted.

Beach Disposal Records. The Contractor shall record the number of truck loads (scraper loads) of material to each fill cell on a daily basis and provide a cumulative summary. A spreadsheet shall be submitted daily to the Contracting Officer's Representative listing:

* date
* disposal area (i.e. 46th Street or 50th Street or 54th Street, etc.)
* # of dumps for each size of truck/scraper utilized
* daily quantity in cubic yards
* cumulative quantity for the disposal area currently being filled
* cumulative quantity for the entire beach fill to date

Date	Area	# of Truckloads	Daily Qty	Cumulative Qty for Area	Total Qty

The spreadsheet shall be produced in Microsoft Excel and e-mailed to the Contracting Officer's Representative daily, no later than 8:00 a.m. the following work day.

3.2.5 Nearshore Disposal

If the Contractor chooses nearshore disposal, then the dredge material shall be placed in the designated nearshore disposal area. Prior to the disposal of any material in the nearshore disposal area, the corners of the disposal area shall be marked by the Contractor with Coast Guard approved buoys. The Contractor shall make periodic inspections of the buoy locations to ensure they have maintained their correct position.

The dredge material shall be deposited in such a manner so as to minimize turbidity, using deflectors, baffles or best available technology. The discharge end of the pipe shall be submerged and shall be no more than 5 vertical feet above the surface of disposal fill.

The discharge pipeline shall be properly marked to avoid creating a hazard to navigation.

3.3 NEARSHORE DISPOSAL SITE SURVEYS

The Contractor shall provide a survey of the nearshore disposal site after every 50,000 cubic yards of material placed at the site. Soundings shall be taken a minimum of 50 foot line spacing, and the coverage shall extend a minimum of 100 feet outside of the designated disposal area on all sides. Survey information shall be provided per paragraph Survey Data. In addition to the x,y,z data, the Contractor shall provide a plot of the soundings in plan view and also cross-sections at every 100 foot spacing.

3.4 DREDGE QUANTITIES

Quantity of material available above the design invert as of the condition surveys of September 1999, June 2000, February 2001, and May 2002 are as listed below. The estimated quantity specified in the Bid Schedule is based upon the May 2002 and Feb 2001 numbers.

Station	Quantity (cubic yards)			
	Sept 99	June 00	Feb 01	May 02
7+00 to 12+75	50,420			99,410
8+50 to 12+75		54,100		
12+75 to 26+00	103,630	116,500		135,115
26+00 to 40+00	63,880	65,670		53,950
40+00 to 54+00	41,420	59,590		32,330
54+00 to 68+00	32,290	42,280		11,100
68+00 to 82+00	27,600	38,020		14,000
82+00 to 96+00	19,270	27,020		11,350
96+00 to 110+00	15,550	23,600		8,490
110+00 to 124+00	9,130	15,910		2,790
124+00 to 138+00	6,640	13,600		675
138+00 to 150+00	1,870	10,260		2,465
	371,700	466,550		371,675
			Reach 2	
150+00 to 164+00			8,150	4,750
164+00 to 174+00			7,230	6,460
174+00 to 178+00			4,910	
178+00 to 190+00			13,510	
			33,800	

3.5 TOLERANCES

Dredging / Excavation shall be carried to the lines and grades shown on the plans, with a vertical tolerance of plus or minus 6 inches. Either extreme of the tolerance shall not be continuous over a length of channel greater than 200 feet.

A horizontal clearance of 5 feet is allowed at revetted slopes, channel

walls, and bridge piers.

3.6 EXCESSIVE DREDGING

The Contractor shall ensure not to impact the rock stabilizers located at approximate Stations 13+00 and 170+20. See drawings for details.

Materials dredged from below the invert which result in extra costs shall be the responsibility of the Contractor.

3.7 SAMPLING OF MATERIAL

The Contractor shall obtain representative sediment samples of the dredged / excavated material.

The samples shall be taken at evenly spaced intervals of material volume, every 40,000 cubic yards. Each sample (water extracted) shall not be less than one (1) liter and shall be obtained in clear plastic bottles. Immediately after collection, the samples shall be delivered to the address specified herein below. The bottle lids shall be suitably secured to preclude opening or leaking during shipment. The sample number shall be placed on the lid using indelible ink. Sufficient cushioning material shall be placed around the samples to prevent excessive movement and damage during shipment.

A Dredge Sample Data Form shall accompany each sample in a clear, sealed plastic bag and shall include the description of the dredge cut location by coordinates and stationing, dredge cut elevation, disposal location, date, time, sample number, and the name of the person who collected the sample. A copy of the sample form is provided at the end of this section. The Contractor shall notify the Contracting Officer's Representative 48 hours in advance of sample collection. Samples shall be delivered to:

U.S. Army Corps of Engineers
ATTN: Baseyard Soils Laboratory
645 North Durfee Avenue
South El Monte, CA 91733-4399
Attn: Art Moncayo Tel: (626) 401-4095

3.8 CONTRACTOR'S SURVEYS

3.8.1 Survey Data

a. Reference is made to SECTION 00800: SPECIAL CONTRACT REQUIREMENTS, QUANTITY SURVEYS, FAR 52.236-16, which bases payment on Contractor surveys. These pre-dredge and post-dredge surveys shall be performed by an independent surveyor hired by the Contractor. Progress payments will be based upon Contractor's survey. Condition surveys supporting extreme weather (storm) shoaling, and the final survey for the final survey drawings will be based upon surveys performed by an independent surveyor hired by the Contractor.

b. The independent survey contractor shall have a current Land Surveyor's license, authorized to certify surveys in the State of California. The Independent Land Surveying Firm selected by the Contractor must be approved by the Contracting Officer prior to performing surveys for this contract.

c. Condition surveys supporting extreme weather (storm) - related shoaling will be considered for payment, provided that the Contractor's independent conducted surveys clearly show the condition before and after each shoaling event and the condition after removal of material from the shoaled area. Survey needs to cover adjacent areas to the shoaling. Survey data which does not meet all applicable requirements and quality assurance verifications will not constitute a valid request for payment of shoaling.

d. The surveys shall be performed electronically (automated) and the data shall be provided and submitted to the Government on an electronic media (IBM compatible, ASCII format) in delimited files of easting, northing, and depth (x,y,z), where the depth is indicated as negative if recorded below NGVD 29 (MSL). The first lines of the data file will list the information as follows:

* Project Name (Lower Santa Ana River Dredging)
* Surveyor's Name and Company
* Area Surveyed (LSAR - Sta 35+00 to 151+00)
* Type of Survey and Date of Survey
* Vertical Datum (NGVD 1929)
* Horizontal Datum (NAD 1927)
* For a bathymetric survey, Tide Gage Location

These first 7 lines will be preceded by an asterisk (*), which indicates a comment line.

Survey lines within the channel shall be conducted at maximum spacing of every 100 feet.

e. Survey Cross-Sections: The Contractor shall provide Survey Cross-Sections for the pre-dredge and post-dredge conditions. Surveys for these Final Cross-Sections shall be conducted by an independent survey firm. The survey data shall be submitted in the format outlined above. 4 sets of hard-copies of the cross-sections shall be provided to the Contracting Officer.

3.8.2 Sounding Data Standards for Hydrographic Surveys

If Contractor utilizes hydrographic surveys: then the Contractor's hydrographic surveys for progress payment or evidence supporting extreme(storm) weather-related shoaling or final survey drawings shall meet or exceed the survey standards listed in EM-1110-2-1003 (Hydrographic Surveying) for Class I surveys. Surveys shall be in the State Plane Coordinate System of NAD 1927 - feet, Zone 6, State of California, and be performed by an independent hydrographic survey contractor with at least three (3) years of experience in hydrographic surveying of navigable channels and have either a current Land Surveyor's or a Professional Engineer's license, authorized to certify surveys in the State of California. The hydrographic surveyor firm selected by the Contractor must be approved by the Contracting Officer prior to performing surveys for this contract.

3.8.3 Positioning System

It is required that hydrographic surveys shall be conducted using an Automated Range-Azimuth Positioning System or Differential Global Positioning System (DGPS) with positional accuracy of +/- 10 feet (1 DRMS)

or better that is linked to an automated (digital) depth recording device capable of continuous logging of x,y,z positional data with depth measurement resolution to the nearest two-tenths (0.2) of a foot. Digital depths shall be supplemented by analog depth records if survey is performed by single beam echosounder. Sounding lines shall be verified by crosslines at least 10 percent of the principal lines and along the centerline of channel. Distance between successive soundings (sounding interval) shall be no more than 10 feet. Soundings shall be reduced to sounding datum (NGVD 29 - Mean Sea Level) by using actual tides and other appropriate corrections resulting in an accuracy of +/- 0.7 feet from actual depth.

For land surveys, vertical accuracy shall be +/- 0.1 feet from actual elevation.

3.8.4 Survey Firm Acceptance

For the Contracting Officer to approve the selected survey firm, the Contractor must provide documentation indicating that modern electronic horizontal positioning and vertical positioning equipment will be used for the surveys to be performed as well as documentation verifying the experience of the operators using the equipment. Typical information that will be required, as a minimum, includes the name, model, and year of manufacture of the electronic equipment, the electronic frequencies of the horizontal positioning equipment and vertical positioning equipment, and the manufacturer's stated positioning and vertical accuracies, and capability of the equipment proposed for usage.

For hydrographic surveying, the Contractor must provide information that a safe and suitable vessel meeting U.S. Coast Guard requirements is available and will be used for operation in the waters where the surveys are to be performed. The Contractor shall submit credentials/qualifications as evidence that qualified, experienced staff are available and will be used for the operation of the vessel as well as for the electronic positioning and sounding equipment.

3.9 PRE-DREDGE AND FINAL SURVEYS

The Government may perform a pre-dredge survey and a post-dredge survey. For the post-dredge survey, the Contractor shall notify the Contracting Officer not less than fourteen (14) working days prior to completion of the entire work. Or the Contractor may request a final survey for a significant phase of completed channel.

The following are considered significant areas (phases) that may have pre-dredge and post-dredge surveys independent of the other areas:

Station 35+00 to 151+00
Station 150+00 to 190+00 (Reach 2)
Station 7+00 to 35+00

All areas found to be in compliance with the contract requirements will be accepted and measured for payment in accordance with SECTION 01250: MEASUREMENT AND PAYMENT.

If the post-dredge survey data indicates that the dredged area is not at the invert elevation, the Contractor will be directed to resume dredging and to complete the work to invert elevation. Adjustment in cost for additional post-dredge surveys shall be as specified in paragraph: FINAL

EXAMINATION AND ACCEPTANCE.

3.10 SHOALING

If, before the contract is completed, additional shoaling occurs in any area (phase) because of sediments transported inside the project area, re-dredging at contract price, within the limit of available funds, may be done if agreeable to both the Contractor and the Contracting Officer.

3.11 SURVEY PROFILES OF COMPLETED BEACH NOURISHMENT

The Contractor shall conduct a survey of the beach nourishment area after completion of the project, and provide Beach Nourishment Profiles of the completed beach nourishment site. Profiles shall be conducted at 200 foot spacing, perpendicular to the beach. Profiles shall cover the area from the top of the berm, seaward to an elevation of -4.0 MSL. Survey information shall be provided as called out in paragraph 3.8.1.d Survey Data. In addition, 3 hard copies of the cross-sections shall be provided to the Contracting Officer.

3.12 REPORTING REQUIREMENT

The Contractor will be required to prepare and maintain a Daily Report of Operations and furnish copies thereof to the Contracting Officer's representative. The daily reports shall document dredging operations for all shifts in a 24-hour period. Further instruction on the preparation of the report will be furnished at a preconstruction conference. Copies of sample submittals are provided at the end of the Contractor's Quality Control section.

3.13 FINAL EXAMINATION AND ACCEPTANCE

As soon as practicable after the completion of the entire work, a final examination of the work will be conducted by the Contracting Officer. Should any shoals, lumps, or other lack of contract depth be disclosed by this examination, the Contractor will be required to remove same dredging at the contract rate for dredging. When the area is found to be in a satisfactory condition, it will be accepted finally. Should more than two survey operations by the Government over an area be necessary by reason of work for the removal of shoals disclosed at a prior survey, the cost of such third and any subsequent survey operations will be charged against the Contractor at the rate of $3,000.00 per day for each day in which the Government plant is engaged in sounding and/or is en route to or from the site or held at or near the said site for such operations.

Final acceptance of the whole or a part of the work and the deductions or corrections of deductions made thereon will not be reopened after having once been made, except on evidence of collusion, fraud, or obvious error, and the acceptance of a completed section shall not change the time of payment of the retained percentages of the whole or any part of the work.

Dredge Sample Data Form

LOWER SANTA ANA RIVER DREDGING - 2003

Contract No.: _____ Task Order No.: _____

Contractor Name: _____

Date: _____ Time: _____

Type of Dredge / Excavation Equipment:

_____

Cut Location

Area: _____

Station: _____

Range: _____

Elevation: _____

Placement Location

Area: _____

Elevation: _____

Sample Obtained By: _____

Sample Obtained From:_____

Remarks:

_____

_____

_____

Note: A copy of this completed form shall accompany the sample when shipped to the laboratory for testing.

-- End of Section --